The Art Rejection

The examiner has rejected Claim 1, 4-10 and 12-13 as anticipated under Section 102 over Derrick U.S. Patent No. 3,893,847 ("Derrick"). Derrick is a patent filed in 1971, more than thirty years ago. The examiner has also rejected Claims 2, 3 and 14 as obvious over the same Derrick reference. Please note that Claim 6 has been cancelled and its limitation inserted into Claims 1 and 12.

Prior to considering the rejections under Section 102 and 103, it may be helpful to the examiner to summarize the invention as claimed and the problem it solves.

The objection of the present invention is to provide a highly useful synthetic fuel that contains at least 90% coal dust. This invention very importantly provides synthetic fuel having in certain circumstances higher BTU content that natural coal and uses as its main ingredient, coal dust, what up to now has been a waste product of ever increasing environmental harm and concern.

The invention fuel is also advantageous because among other reasons (1) more coal can be shipped per unit volume; (2) the fuel is particularly effective for electric utilities which utilities can use the fuel as a direct replacement for coal at the very same stage in their operations; and (3) users experience greater freedom (e.g., less moisture is associated with the inventive synthetic coal than natural coal).

Note that the fuel containing the additives used in the invention often surprisingly has a higher BTU content then coal itself from the same mine and hence gives the utility more value for the same price. It is also particularly advantageous to have a synthetic coal fuel ready for addition to the utility power system as a replacement for natural coal.

The invention as now claimed in one preferred embodiment is directed to a synthetic fuel, comprising:

(a) at least about 90 wt. % of coal dust;

(b) from about 0.5 to 8.0 wt. % based on the weight of the coat dust of one or more organic chemicals selected from the ground consisting of functionalized starches, copolymers of sodium acrylates and acrylamide and mixtures thereof reactive with said coal dust, and

(c) water.

In the inventive embodiments, element (a), coal dust, is either a waste product of present manufacture of coal at or near a mine or obtained from a waste storage facility such as a coal lagoon.

Element (b), reactive organic chemicals useful for this invention, are functionalized starches, monosaccharides, disaccharides, polysaccharides, copolymers of sodium acrylates and acrylamide and mixtures thereof as described hereafter. These organic chemicals form either a chemical bond, a bond by hydrogen bonding, a bond of Van der Waal forces or other types of bonding with the coal dust. Since coal is mostly carbon, surprising a very unreactive element in many cases, it is speculated that the organic chemical may in fact be reacting mostly with small amounts of impurities found in coal dust to form the unexpected strong binding forces and also give the resultant product a higher BTO content.

Preferred additives for this invention includes functionalized starches along with their salts and its esters Starch is a carbohydrate polymer having organic repeating units.

Starch obtained from plants, of which wheat, corn, potato, tapioca and rice are common raw sources for such addition. The functionalizing modifications usually change the starch from a white, semi-crystalline, powder form.

With the above in mind it is submitted that Derrick is not a teaching of the invention of the now pending claims.

Derrick teaches that finely ground iron ore can be mixed with water and a high molecular weight straight chain water soluble polymers to form an agglomerate – Col. 1, lines 44 to 54. It is conceded that Derrick states that a very large number of other "finely ground" material including coal dust may possibly use the Derrick invention; however its teaching is directed to iron ore.

There is no teaching in Derrick of any of the chemicals now covered by modified Claim 1 – note that Derrick literally discusses millions of chemicals however with his high molecular of 25,000,000 being the "heart of his invention" – see Col. 1, lines 54 to 61. In addition Derrick highlights heat treatment to result in induration at temperatures from 1200° to 1350° C – such extreme temperatures would burn coal and destroy it – see Col. 3, lines 4 to 6 of Derrick.

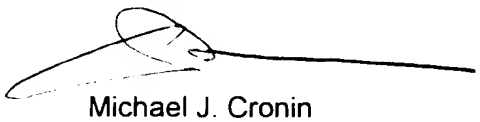
In summary, Derrick is really of different product (iron ore), a different chemistry – extremely high molecular weight polymers - and the use of extreme heat and temperature not applicable to coal. It is not accurate to say Derrick teaches applicant's invention and makes it not novel or obvious.

CONCLUSION

This invention fills a long-felt need and creates a surprising product that will result in an environmental clean-up while providing a higher value fuel to public utilities. Based on the above explanation, the invention is clearly not anticipated, or obvious, over the reference of record.

Reconsideration for the rejection is respectfully requested and the allowance of the pending claims solicited.

Respectfully submitted,



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CERTIFICATE OF MAILING

I hereby certify that the accompany Amendment and Response in this matter is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

Commissioner of Patents and Trademarks
Washington, DC 20231

on September 25, 2002

Brenda L. Heaton
(Name of person making deposit)

Brenda L. Heaton
(Signature)

September 25, 2002
(Date)

Modified Claims:

1. A synthetic fuel composition, comprising:

(d) at least about 90 wt. % of coal dust;

(e) from about 0.5 to 8.0 wt. % based on the weight of the coat dust of one or more organic chemicals selected from the group consisting of functionalized starches, copolymers of sodium acrylates and acrylamide and mixtures thereof reactive with said coal dust, and

(f) water.

3. A fuel composition according to Claim 1, wherein the coal dust is from anthracite coal.

4. A fuel composition according to Claim 1, wherein the organic chemical is a copolymer of one or more sodium acrylates and acrylamides.

5. A fuel composition according to Claim 1, which has been compacted.

7. The fuel composition according to Claim 1 wherein the organic chemical is a copolymer of sodium acrylate and acrylamide.

8. The synthetic fuel composition according to Claim 1, wherein the organic additive is selected from the group consisting of polysaccharide resins, copolymers of sodium acrylate and acrylamide and mixtures thereof.

9. The synthetic fuel composition according to Claim 1, wherein about 90% of the particle of the coal dust are 50 microns or less.

10. A synthetic fuel component comprising:

a) at least about 90 wt. % of coal dust;

b) about 0.5 to 8 wt. % based on the weight of the coal dust of one or more functionalized starches; and

c) water.

11. They synthetic fuel composition according to Claim 10, where the functionalized starch is one or more polysaccharide resins consisting of a solution of a polysaccharide having a dextrose equipment between 0.1 and 100 wherein the polysaccharide has been chemically modified.

12. A method of making a synthetic fuel composition, comprising:

a) mixing at least about 90 wt. % of coal dust with water and with one or more organic chemicals selected from the group consisting of functionalized starches, copolymers of sodium acrylates and acrylamide and mixtures thereof reactive with said coal dust to form a composition; and

b) compacting the composition; thereby forming the synthetic fuel composition.

13. The method of Claim 12 wherein at least about 90 % of the particle sizes of the coal dust is 50 microns or less.

14. A method of making a synthetic fuel composition according to Claim 12, wherein compaction is provided by a pug mill.